



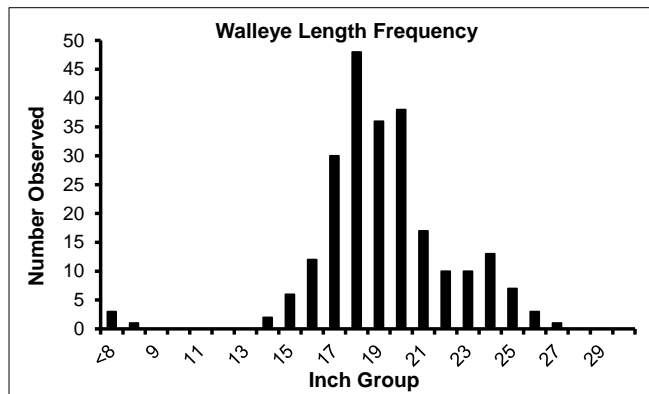
# WISCONSIN DNR FISHERIES INFORMATION SHEET

**LAKE:** Lake Lucerne

**COUNTY:** Forest

**YEAR:** 2018

The Wisconsin Department of Natural Resources conducted a comprehensive survey of Lake Lucerne, Forest County, to analyze the health of its fishery. Lake Lucerne is located just southeast of Crandon, with boat access off of Lake Lucerne Drive in the southeast corner of the lake. Lake Lucerne covers 1,026 acres and achieves a maximum depth of 73 feet.



\* Note: Adult walleye are defined as all sexually mature fish and all fish of unknown sex  $\geq 15$

## Walleye



A mark-recapture survey was conducted to estimate the abundance of adult walleye in Lake Lucerne during 2018. In May, a total of 237 different walleye (233 considered adults) were captured during fyke net and electrofishing surveys. Based on our survey data we estimate the adult walleye population in Lake Lucerne to be approximately 661 fish (0.64/acre). This is considered a very low density walleye populations, significantly below the area average of approximately 1.5 adult walleye/acre.

Every walleye captured during our spring survey, 237 fish, was measured to assess size structure. After removing the few fish that were less than 10 inches approximately 99.1% of the walleye captured were  $\geq 15$  inches and 42.5%  $\geq 20$  inches. The current size structure is substantially higher than the area average of approximately 84.4%  $\geq 15$  inches and 35.7%  $\geq 20$  inches. High size structure is common in low density populations, due to the lack of young/small fish coming up in the population, creating an artificially high size structure.

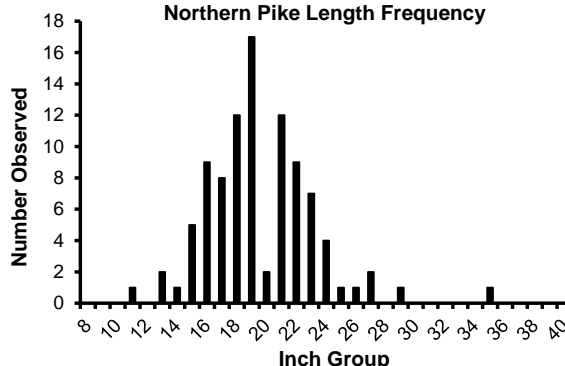
## Northern Pike



Northern pike were assessed during the early spring surveys designed to best sample walleye. Over three days of netting the relative abundance of northern pike was measured at 3.2 fish/net-night, lower than the area average of 4.6 fish/net-night.

Every northern pike captured during the early spring netting and electrofishing surveys was measured to assess size structure, a total of 95 fish. After removing fish  $< 14$  inches, approximately 41.3% of the fish sampled were  $\geq 21$  inches, and 2.2%  $\geq 28$  inches in length. These values are well below the area average of 49.9%  $\geq 21$  inches and 12.2%  $\geq 28$  inches, suggesting that the size structure of northern pike in Lake Lucerne is poor.

## Northern Pike Length Frequency



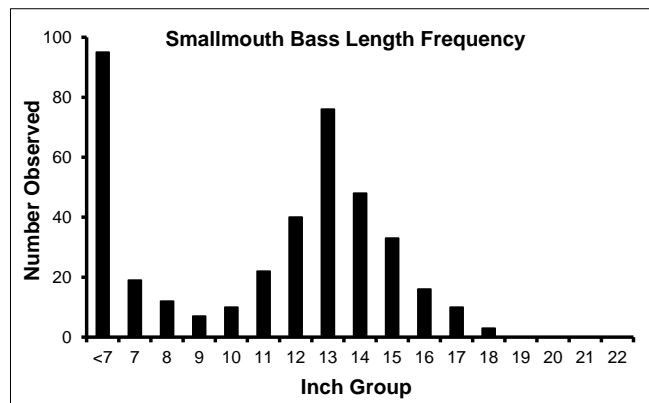
\* Note: Adult northern pike are defined as all sexually mature fish and fish of unknown sex  $\geq 12$  inches long.

## Smallmouth Bass



Smallmouth bass were captured during the surveys to assess walleye as well as two electrofishing surveys directly targeting bass during the month of June. A total of 391 different smallmouth bass were captured during the surveys targeting bass, 277 of those fish were  $\geq 8$  inches and considered adults. Typically we would assess abundance of bass using the catch rate of adult bass per mile electrofished during surveys designed for bass. However, Lake Lucerne has low water conductivity which reduces the efficiency of electrofishing as the water warms, meaning that while many smallmouth bass were observed during our surveys a small percentage of them were actually captured. However, a mark-recapture survey was conducted during 2015 by Mole Lake Fisheries estimating the adult ( $\geq 8$  inches) smallmouth bass population at 3.9 adults/acre. Data from the 2015 survey showed that the smallmouth bass population in Lake Lucerne was very slow growing, suggesting that at just under 4 adults/acre smallmouth bass were over abundant in Lake Lucerne. This data led to the removal of the minimum length limit on bass in Lake Lucerne at the start of the 2018 fishing season.

All 391 different smallmouth bass captured during the bass electrofishing surveys were measured to assess size structure of the Lake Lucerne population. After removing the fish less than 7 inches, approximately 37.2% of the smallmouth captured were  $\geq 14$  inches and 4.4% were  $\geq 17$  inches. The 2018 size structure was considerably better than the size structure during 2015 when 23.4% and 4.4% of the smallmouth captured were  $\geq 14$  and 17 inches respectively. While size structure seems to have improved it is still well below the area average of 46.1%  $\geq 14$  inches and 16.3%  $\geq 17$  inches.



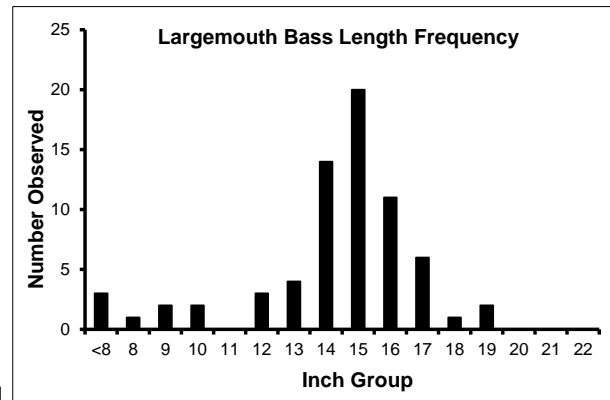
\* Note: Adult bass are defined as all bass  $\geq 8$  inches long.

## Largemouth Bass

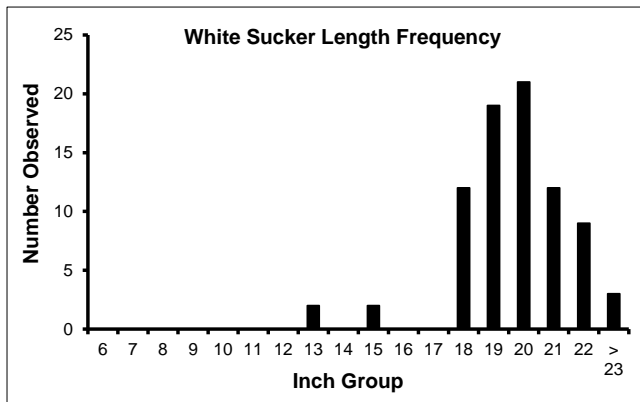


Largemouth bass were captured during all of the surveys conducted during 2018. Like smallmouth bass, the two surveys specifically targeting bass were used to assess their population. We were not able to assess largemouth bass abundance due to low conductivity issues. However, largemouth bass abundance was estimated at 1.2 adults ( $\geq 8$  inches) per acre during the 2015 survey conducted by Mole Lake Fisheries. At just over 1 adult/acre Lake Lucerne's population is considered low density.

A total of 69 different Largemouth bass were captured during the two bass surveys, all of these fish were measured to assess the size structure of the population. For 2018, approximately 81.8% of the largemouth bass captured were  $\geq 14$  inches and 4.5%  $\geq 18$  inches. This distribution demonstrates that the size structure of the Lake Lucerne largemouth population is above the area average of 44.1%  $\geq 14$  inches and below the area average of 6.9%  $\geq 18$  inches.



\* Note: Adult bass are defined as all bass  $\geq 8$  inches long.



## White Sucker



White sucker was the 2nd most abundant fish species captured during our early spring fyke net survey. At 3.3 fish/net-night white sucker are of average abundance when compared to other waters in our area.

Every white sucker captured during spring netting, a total of 79 fish, was measured to assess the size structure of the population. The size structure of the Lake Lucerne white sucker population indicates is very impressive with 94.8% of the fish captured being  $\geq 16$  inches and 54.5% being  $\geq 20$  inches in length.

Young white sucker likely make up a large portion of the available forage for young game fish, making white sucker a very important species in Lake Lucerne which lacks available forage.

## Lake Herring (Cisco)



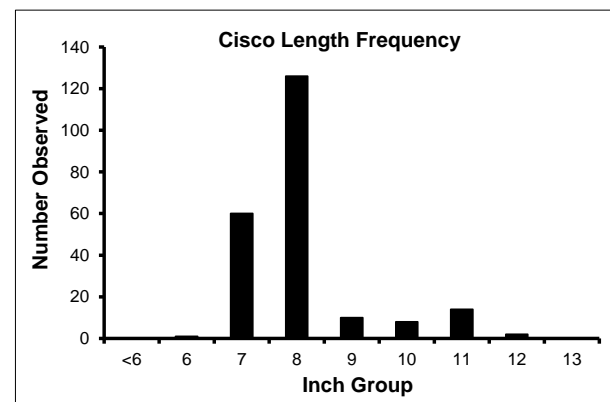
## and Lake Whitefish

Low productivity leading to a seemingly low amount of available forage seems to be the main challenge facing the Lake Lucerne fishery. Lake herring (cisco) and lake whitefish are fairly intolerant species of fish that requires cold, well oxygenated water to survive. Both of these species are thought to be native to Lake Lucerne but their abundance seems to have decreased tremendously in recent decades.

In November of 2013, an opportunity presented itself to transfer a small number of disease-free cisco to Lake Lucerne from North Twin Lake, Vilas County. With the help of Mole Lake Fisheries a total of 217 cisco, ranging from 10 to 14 inches, were transferred to Lake Lucerne. Mole Lake Fisheries conducted a survey in late November of 2016, the results of this survey suggested that the transferred cisco had survived well in Lake Lucerne. During November of 2018 a partnership between the Lake Lucerne Association, Mole Lake Fisheries, and WDNR was successful at transferring another 750 cisco to Lake Lucerne. The cisco transferred in 2018 ranged from 6.6 to 12.0 inches in length with approximately 72.3% being  $\geq 8$  inches and 10.9%  $\geq 10$  inches in length.

Mole Lake Fisheries (in a partnership with UW-Milwaukee) was able to obtain a total of 412 lake whitefish that were hatchery reared and stock them into Lake Lucerne during 2017-18.

The goal of these projects is to re-establish naturally reproducing populations of cisco and lake whitefish. If sizeable populations of either of these species were produced they would help increase the available forage in



\* Note: Subsample of the cisco transferred during 2018.

## Other Species

The species listed above were the focus of the 2018 survey, with surveys designed to best sample these individual species. Other species captured during our survey efforts include; rock bass, bluegill, yellow perch, black bullhead, yellow perch, fathead minnow, bluntnose minnow, and mottled sculpin. Based on catch rates and observations during this survey, rock bass appear to be of moderate abundance; bluegill and juvenile yellow perch were of moderate to low abundance, while adult yellow perch were rare, bullhead species are of low abundance, and fathead minnow, bluntnose minnow, and mottled sculpin are considered present.

This report is interim only; data and findings should not be considered final.  
For answers to questions about fisheries management activities and plans for Lake Lucerne contact:

Greg Matzke, Fisheries Biologist  
Wisconsin Department of Natural Resources  
(715) 528-4400 Ext: 5 Email: Gregory.Matzke@Wisconsin.gov